Name _____ Period ____

Lab Partners _____

FRESHWATER POLLUTION TESTING

In this lab, the levels of some major factors that lead to the pollution of streams, lakes, rivers, and ponds will be measured and studied. The actual amount of pollutants in these water sources plays a vital role in the biodiversity of aquatic organisms in nature. If levels of pollutants reach certain levels, the ability of specific organisms to reproduce and thrive is greatly dampened and in some cases even halted. If levels of pollutants become too highly concentrated, and certain species of individuals become scarce or even extinct, food chains could be altered. This, in turn, could change the structure of ecosystems as we know them today.

DATA

	Tap Water		Wetlands	
Factor	Color	pH or ppm	Color	pH or ppm
pH				
Dissolved Oxygen				
Phosphate				
Chlorine				
Nitrate				

ANALYSIS QUESTIONS

(Note: For some of the questions, you will need the handout about water pollution indicators.)

1. Given the pH found for the water sample from our wetlands, would you classify the water as acidic, basic, or neutral? Explain your answer.

2. Could most aquatic organisms survive in our wetlands given the pH found? Explain your answer.

3. Which type of water (tap water or wetlands) has the most dissolved oxygen?

4. Could fish survive in our wetlands given the dissolved oxygen levels found? Explain your answer.

5. Did either of the water samples have phosphate levels that may lead to an overgrowth of aquatic plants? If yes, which ones and how do you know? If no, how do you know?

6. Which water sample (tap water or wetlands) had the least chlorine?

7. Has the concentration of nitrogen reached unfit drinking levels in any of the samples? If yes, which ones and how do you know? If no, how do you know?

8. According to the various tests, would you describe the water from the wetlands sample to be polluted or non-polluted? Explain your answer.

9. What can be done to help minimize the amount of each pollutant in your local water sources?

CONCLUSION

In at least 3 sentences, describe what you learned from this lab. Be specific. Use information from the handout on water pollution indicators as well.

Water Pollution Indicators

pH

- Scale with range of 0-14
- 7 is neutral
- Less than 7 is acidic
- Greater than 7 is basic
- Most aquatic organisms require range between 6.5 and 8.2
- Lots of algae-higher pH (remove CO_2 during photosynthesis)

Dissolved Oxygen

- One of most important indicators of overall health of body of water
- High levels (6 ppm or more) supports the most diversity
- Low levels (below 3 ppm) stressful, not much life
- Below 2 ppm-no fish life

Phosphate

- Originates from fertilizers and wastewaters
- Control water hardness
    - Hard water-Water that contains mineral salts (as calcium and magnesium ions) that limit the formation of lather with soap
- Levels more than 0.03 ppm may lead to overgrowth of aquatic plants
    - Depletes oxygen
    - More fish killed

Chlorine

- Not naturally found in water (added to kill bacteria)
- Maintained under 0.75 ppm
- Large levels can be fatal to aquatic organisms

Nitrate

- Accumulate from decaying vegetation, the atmosphere, fertilizer, sewage
- Unpolluted water-level less than 4 ppm
- Levels greater than 10 ppm is unfit to drink
- High levels cause overgrowth of algae

pH Test

1. Fill the water sample tube to the 10-mL line with the appropriate water sample.
2. Add ONE pH Wide Range TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Compare the color of the sample to the pH color comparison chart. Record the findings in the data table.
5. Dispose of the reacted sample in the sink and rinse the water sample tube twice.

Dissolved Oxygen Test

1. Fill a dissolved oxygen test vial to overflowing with the appropriate water sample.
2. Add TWO dissolved oxygen TesTabs to the vial.
3. Cap the vial and be sure that there are no air bubbles in the sample.
4. Invert the vial and mix until the tablets have dissolved.
5. Wait for about five minutes.
6. Compare the color of the sample to the Dissolved Oxygen color chart. Record the findings as parts per million in the data table.
7. Dispose of the reacted sample in the sink and rinse the vial twice.

Phosphate Test.

1. Fill the water sample tube to the 5-mL line with the appropriate water sample.
2. Add ONE Phosphorus TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Wait for about five minutes.
5. Compare the color of the sample to the Phosphate color comparison chart. Record the findings as parts per million in the data table.
6. Dispose of the reacted sample in the sink and rinse the water sample tube twice.

Chlorine Test

1. Fill the water sample tube to the 5-mL line with the appropriate water sample.
2. Add ONE Chlorine DPD #4R TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Compare the color of the sample to the Chlorine color comparison chart. Record the findings as parts per million in the data table.
5. Dispose of the reacted sample in the sink and rinse the water sample tube twice.

Nitrate Test

1. Fill the water sample tube to the 5-mL line with the appropriate water sample.
2. Add ONE Nitrate Wide Range TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Wait for about five minutes.
5. Compare the color of the sample to the Nitrate color comparison chart. Record the findings as parts per million in the data table.
6. Dispose of the reacted sample in the sink and rinse the water sample tube twice.